

Surname	Centre Number	Candidate Number
Other Names		2



**GCE AS/A level**

1211/01

**GEOLOGY – GL1  
Foundation Unit**

A.M. TUESDAY, 13 May 2014

1 hour

**Suitable for Modified Language Candidates**

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	17	
2.	14	
3.	14	
4.	15	
<b>Total</b>	<b>60</b>	

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**ADDITIONAL MATERIALS**

In addition to this examination paper, you will need:

- the Mineral Data Sheet;
- a calculator.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions in the spaces provided in this booklet.

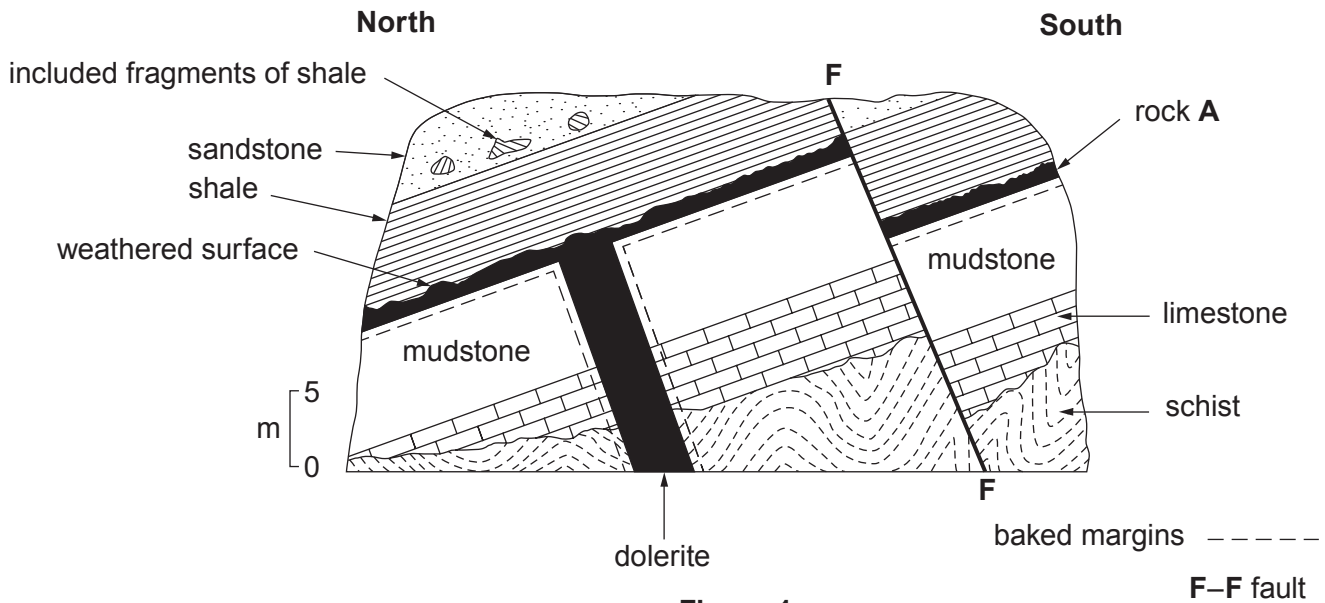
**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that marking will take into account the use of examples and the quality of communication used in your answers.

Answer all questions.

1. **Figure 1a** is a road cutting exposure showing the true dip of the sedimentary units.



**Figure 1a**

(a) (i) State the dip direction of the limestone shown in **Figure 1a**. [1]

(ii) State the youngest rock shown in **Figure 1a** and give **one** reason to explain your answer. [2]

(b) (i) A student **incorrectly** concluded that rock **A** on **Figure 1a** is a sill. Identify **two** pieces of evidence from **Figure 1a** which suggest that it is **not** a sill. [2]

1. ....
2. ....

(ii) Suggest **one** similarity and **one** difference in the texture and/or mineralogy you might expect to observe when comparing rock **A** and the dolerite shown on **Figure 1a**. [2]

Similarity .....

Difference .....

(c) (i) Measure the throw (vertical displacement) of the fault shown in **Figure 1a**. [1]

..... metres

(ii) State the type of fault shown on **Figure 1a** and give a reason to support your answer. [2]

Type of fault .....

Reason .....

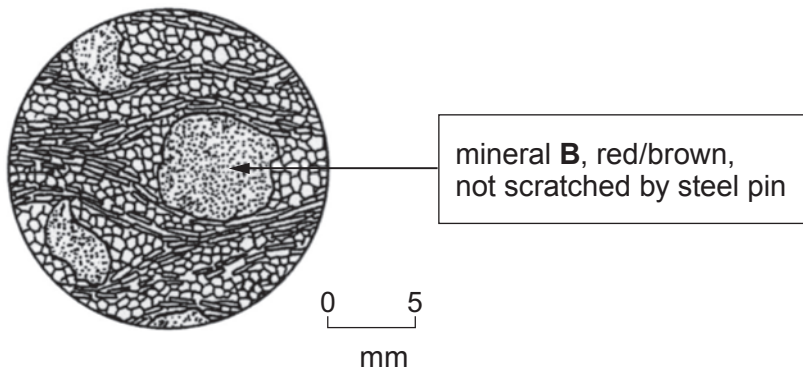
(d) (i) Mark onto **Figure 1a** using the symbols below where you would expect to find examples of each of the following features. [2]

contact metamorphic rock (C) →

regional metamorphic rock (R) →

angular unconformity (U) →

(ii) **Figure 1b** below shows a microscope thin-section view of the schist on **Figure 1a**. Using the mineral data sheet identify mineral **B** in **Figure 1b**. [1]



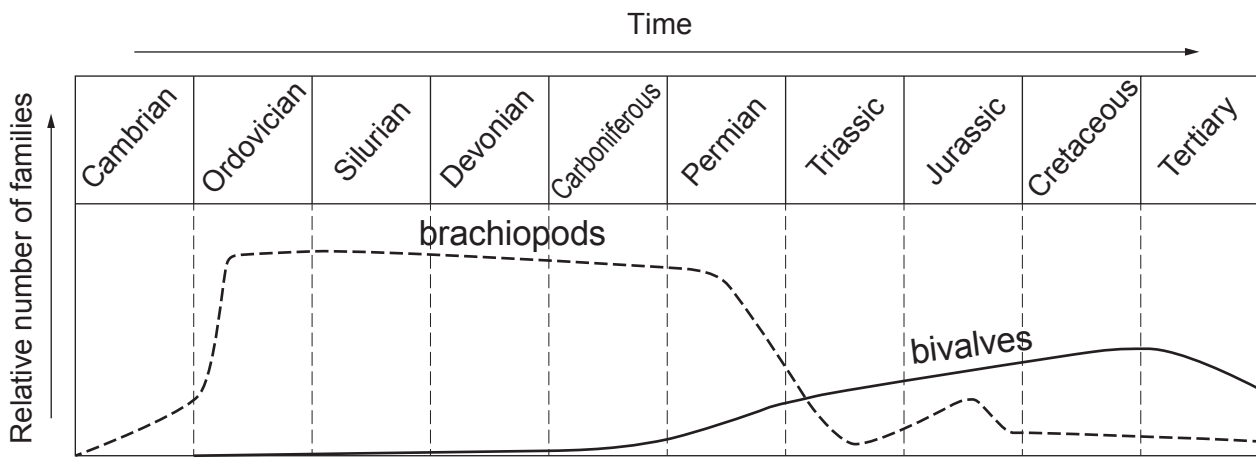
**Figure 1b**

(iii) Describe and explain the texture of the schist in **Figure 1b**. [4]

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2. **Figure 2a** shows the geological histories of the brachiopod and bivalve fossil groups.



**Figure 2a**

- (a) (i) With reference to **Figure 2a**, describe the changes in the relative numbers of bivalve families from the beginning of the Ordovician to the end of the Tertiary. [3]

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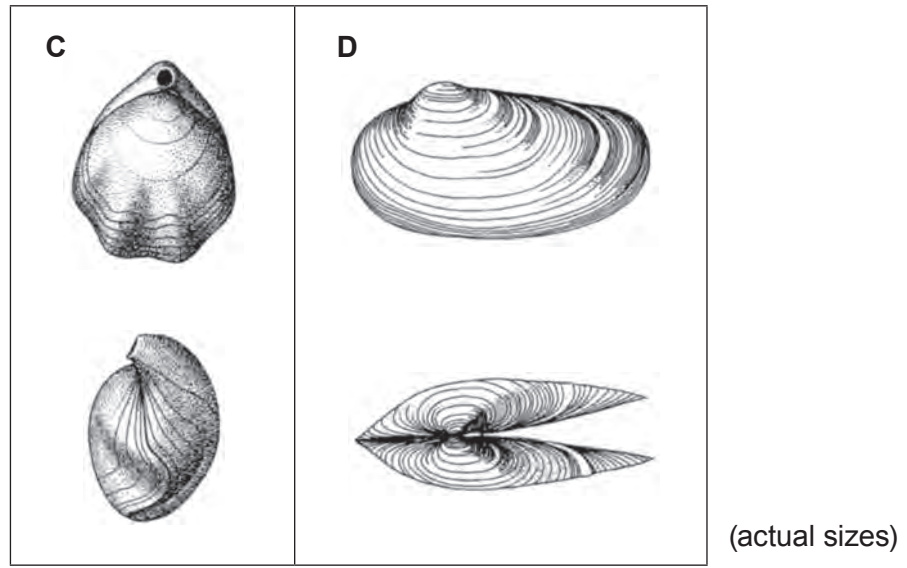
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- (ii) State the geological period during which brachiopods and bivalves were both declining in numbers of families? [1]

.....

(b) **Figure 2b** shows two fossil specimens (**C** and **D**) from different fossil groups.



**Figure 2b**

(i) With reference to **Figure 2b**, complete **Table 2** using the appropriate letters (**C** or **D**) to indicate to which fossil group the description applies. [3]

Fossil Characteristics	Fossil
formed of two valves	<b>C and D</b>
one valve is larger than the other valve	
a plane of symmetry runs between the valves	
each valve has a plane of symmetry	

**Table 2**

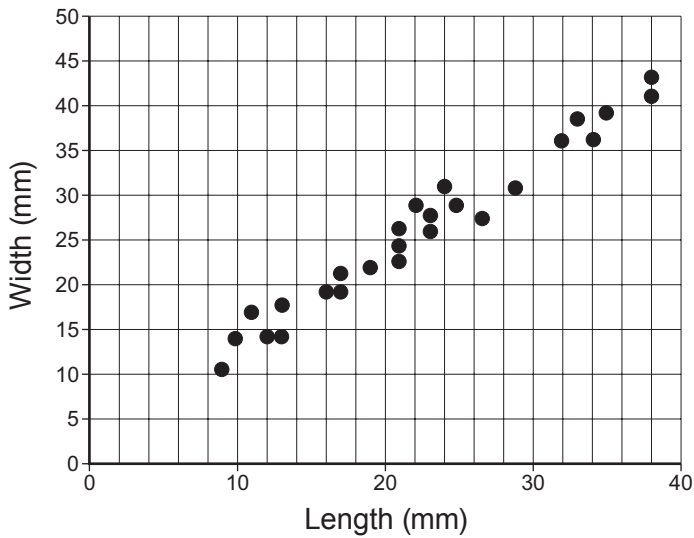
(ii) Name the fossil group represented by **C**. [1]

.....

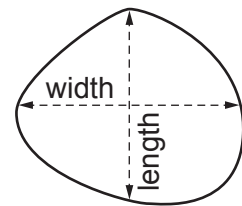
- (c) (i) **Figure 2c** is a scatter graph showing the size of 26 specimens of fossil **D** preserved on a bedding plane surface. The outline of an additional sample is shown in **Figure 2d**.

Measure the dimensions of this shell as indicated and plot onto **Figure 2c**. [2]

Length ..... mm      Width ..... mm



**Figure 2c**



**Figure 2d** (actual size)

- (ii) With reference to **Figure 2c**, suggest whether the fossil specimens of fossil group **D** are likely to represent a life or death assemblage. Give reasons for your answer. [4]

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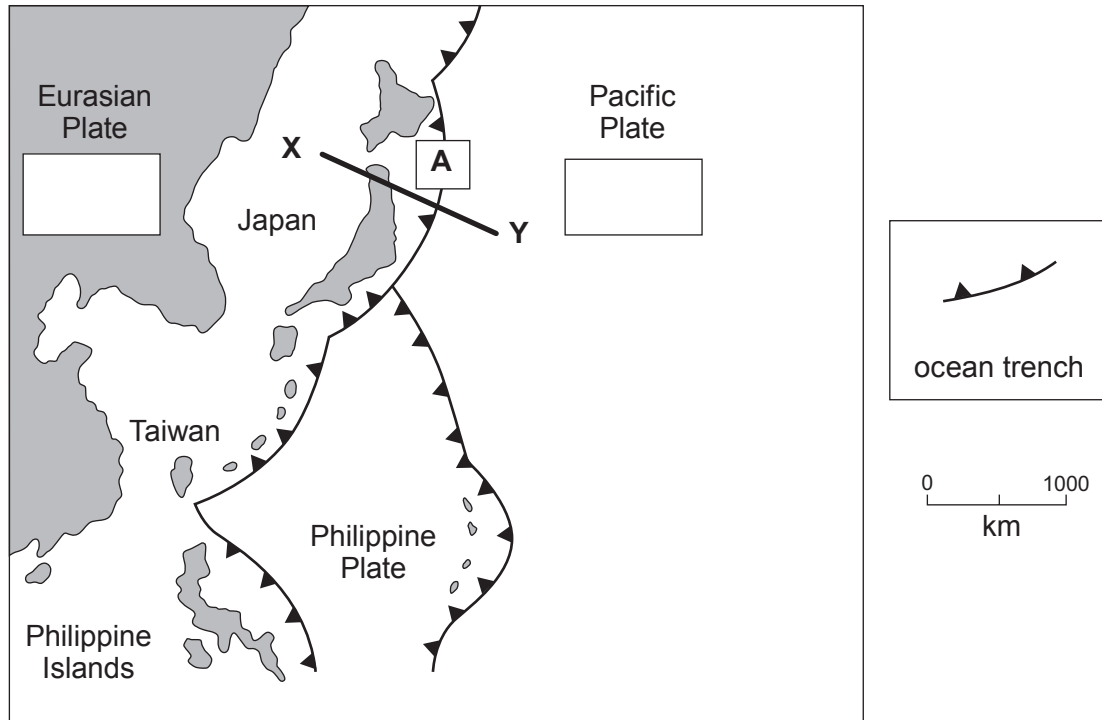
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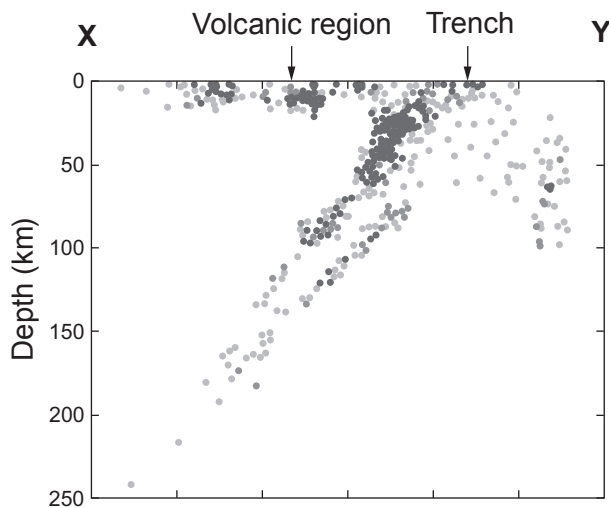
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3. **Figure 3a** is a simplified map showing plate tectonic features of part of the western Pacific.

**Figure 3b** shows the depth of earthquake foci along line X–Y on **Figure 3a**.



**Figure 3a**



**Figure 3b**

- (a) (i) Refer to **Figure 3a** and **Figure 3b**. Draw an arrow in each of the **two** blank boxes in **Figure 3a** to show the relative direction of movement of the Eurasian and Pacific plates. [2]



(ii) State the type of plate boundary present at locality **A** on **Figure 3a** by placing a tick in **one** of the boxes below. [1]

Convergent  Divergent  Conservative

(b) (i) Describe the pattern of earthquake foci shown in **Figure 3b**. [3]

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.....  
.....  
.....

(ii) State and explain **two** reasons for the occurrence and distribution of earthquakes in **Figure 3b**. [4]

1. ....  
.....  
.....  
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2. ....  
.....  
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(c) (i) Magma generated beneath the Japanese Islands is **andesitic** in composition. Explain why **andesitic** magma forms at this plate tectonic setting. [2]

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.....  
.....

(ii) Explain why andesitic magma results in more explosive volcanic eruptions than basaltic magma. [2]

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.....  
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4. Table 4 shows the grain size distribution of three sediments (F, G and H) collected from a river.

Grain size (mm)	64 to 128	32 to 64	16 to 32	8 to 16	4 to 8	2 to 4	1 to 2	0.5 to 1	0.25 to 0.5	0.125 to 0.25	0.0625 to 0.125
Weight % sediment F	15	35	25	15	5	5					
Weight % sediment G					5	22	58	15			
Weight % sediment H									5	35	60

Table 4

(a) (i) Use the data from Table 4 to construct a bar graph for sediment H in Figure 4a.

[2]

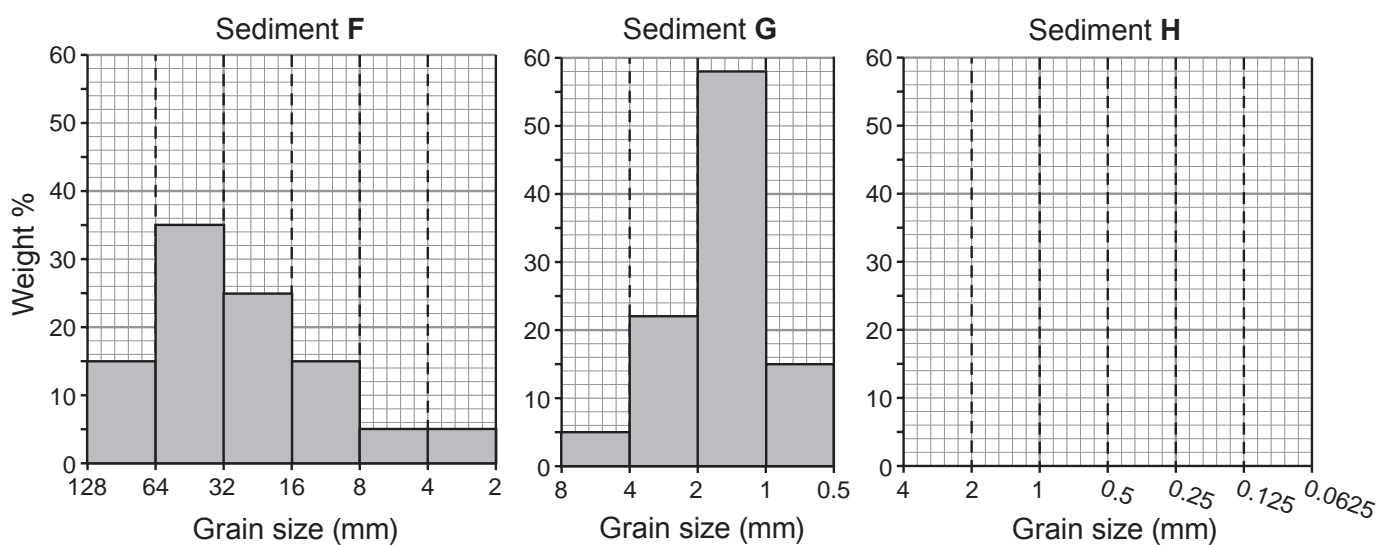


Figure 4a

(ii) State which of the three sediments (F, G or H) could be described as:

[3]


most coarse grained

most poorly sorted

most likely to be located furthest downstream

- (iii) Suggest why there is an absence of silt and clay sized particles (<0.0625 mm) in sediments **F**, **G** and **H**. [2]

.....

.....

.....

- (iv) Describe how grain size and shape are likely to change as a sediment is transported down a river towards the sea. Explain your answer. [3]

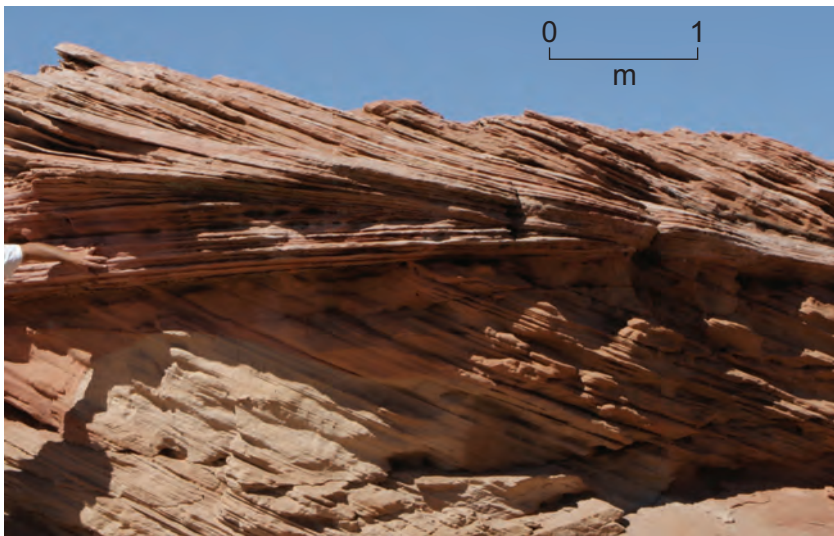
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(b) **Figure 4b** shows a structure commonly found in sediments deposited by a current. **Figure 4c** shows detail of the texture of the rock shown in **Figure 4b**.



**Figure 4b**

quartz grains 0.5 mm in diameter cemented by haematite



**Figure 4c**

- (i) Name the sedimentary structure shown in **Figure 4b**. [1]

.....

- (ii) Explain why the sediment and sedimentary structure shown in **Figure 4b** and **Figure 4c** are **unlikely** to have been formed in a high energy fluvial environment like sediment **F** in **Figure 4a**. [4]

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**END OF PAPER**